

Support for Amendment:

Independent claims 1 and 58 are amended to include the features of canceled claim 2. The amendment is additionally supported by the specification at, for example, page 6, lines 10-16.

Independent claims 1 and 58 are amended to clarify the preamble. The claims are now directed at a mixture for forming a film or membrane. The clarification is supported by the specification.

Dependent claims previously numbered 58-69 have been renumbered as dependent claims 59-70 to correct the typographical error of two different claims having the same claim number.

No new matter is introduced by the amendment, and entry thereof is requested. Upon entry, claims 1, 3-12, 14, 15, 18, 20, 22, 24, 26, 28, 30, 32, and 58-70 are active in this application.

REMARKS

Independent claim 1 is directed at a mixture for forming a film or membrane for treating at least one of a soil surface or a soil mass. The mixture includes a basic powder mixture of a water-soluble, dried and ground organic raw material, a thickening agent, a pigment, at least one component which has a sufficient antioxidising effect to ensure that the film or membrane has an antioxidising effect on the surrounding soil surface or soil mass, and wherein the powder mixture is saturated with electrons to at least electrical neutrality, and wherein the film or membrane is formed by spreading the mixture over the soil surface or by arranging the mixture in the soil mass. As described by the specification of the above-identified patent application at page 1, lines 3-31, the mixture, after it is applied as a dry substance or in a liquid state, solidifies into a degradable film on top and/or at a given depth in the soil.

Independent claim 58 is directed at a mixture for forming a film or membrane for treating a soil mass. The mixture includes a basic powder mixture comprising a water-soluble, dried and ground organic raw material, at least one component which has a sufficient antioxidising effect to ensure that a formed film or membrane has an antioxidising effect on surrounding soil, and thickening agent, and a pigment, and wherein the powder mixture is saturated with electrons to at least electrical neutrality, wherein at least a portion of the film or membrane is formed at some distance down in the soil mass when the mixture is either spread over the soil surface or arranged in the soil mass.

35 USC 102(b) and 103(a) Claim Rejections over US Patent 6,029,395 to Morgan.

The outstanding Office Action includes a rejection of claims 1, 7, 8, 18, and 58 under 35 U.S.C. 102(b) over U.S. Patent 6,029,395 to Morgan. Claims 5, 14, 15, 20, 22, 24, 28, 30, 32, 59-64, and 66-69 stand rejected under 35 U.S.C. §103(a) over Morgan.

In view of the amendment to independent claims 1 and 58, it is submitted that these two rejections over Morgan have been rendered moot. The feature of dependent claim 2 has been incorporated into independent claims 1 and 58. Dependent claim 2 has not been rejected based on anticipation or obviousness over Morgan, and it therefore understood that the incorporation of the feature of dependent claim 2 into independent claims 1 and 58 results in claims that are not anticipated or obvious over Morgan. Accordingly, withdrawal of the anticipation and the obviousness rejections over Morgan is requested.

35 USC 103(a) Claim Rejections over Morgan and US Patent 6,946,496 to Mankiewicz:

Claims 2, 3, 26, and 65 stand rejected under 35 U.S.C. §103(a) over Morgan and U.S. Patent 6,946,496 to Mankiewicz. This rejection is traversed.

Morgan discloses a biodegradable mulch mat comprising an air and water permeable, light impermeable, open celled, composite of granules and fibers in a binder matrix prepared from a foam precursor. See Morgan at Abstract. Morgan discloses that use of a water soluble binder gives an advantage in that a certain amount of the binder may leach from the foam as the foam is applied, resulting in a bonding between the mulch mat and top soil. See Morgan at column 4, lines 1-7. The bonding zone may be from 0.5 to 1 cm thick. See Morgan at column 4, lines 1-4. Morgan discloses that the foam should be applied onto the top soil with a thickness of 2 - 8 cm in field application, resulting in a dry mat with thickness of about 1 cm. See Morgan at column 6, lines 31-46. From the examples presented in Morgan it is found that the amount of dry powder (constituting the fibres, granules, and binder) is from about 100 to 1000 g per square meter soil surface. See Morgan at column 6, line 58 to column 7, line 15. An anti-oxidising compound may also be added to the aqueous foam in order to make the mulch mat more resistive towards UV-light. See Morgan at column 5, lines 1-5.

The outstanding Office Action recognizes that “Morgan is silent about wherein the powder mixture is saturated with electrons to at least electrical neutrality.” This feature is in both independent claims 1 and 58. It is pointed out, however, that there are several additional differences between the present invention and Morgan. Each of these differences is discussed in turn.

Morgan fails to teach or suggest a basic powder mixture that includes at least one component having a sufficient antioxidising effect to ensure that a formed film or membrane has an antioxidising effect on the surroundings according to claims 1 and 58. Instead, Morgan discloses the use of an anti-oxidising compound that may be added to aqueous foam in order to increase the UV-light resistance of the mulch mat itself. See Morgan at column 5, lines 1-5. As such Morgan makes no suggestion regarding the use of antioxidants in sufficient amounts to produce an antioxidising effect on the surrounding environment. Because Morgan only discloses that the binder leaches into the top soil, there is no teaching or suggestion in Morgan that foam

containing any antioxidant would penetrate into the area surrounding the mat. See Morgan at column 4, lines 1-8.

Additionally, and as can be seen from the above-identified application at page 21, line 38 through page 22, line 26, a feature of the disclosed membrane is the ability of the membrane to destroy oxidants in the micro air-layer just above the soil surface (i.e. the surroundings specified in claims 1 and 58). This feature protects the plants from damages caused by formation of ozone in the top soil when illuminated by sun light. Formation of ozone in the top soil is as far as the inventor knows a discovery made by the inventor and represents the unobvious discovery of a new problem. No prior art of the inventor's knowledge teaches the importance of destroying ozone and other oxidisers in the air just above the top soil (including of course; the top layer of the soil). Plant damages due to ozone and other oxidants have traditionally been reckoned as an air-borne pollution problem, and not a problem of ozone formation in the soil surface. Thus a skilled person in the art, believing that ozone damage was airborne problem having no relationship to the soil itself, would not have been lead by the cited prior art to arrive at the claimed invention and specifically to the claimed feature of at least one of the compounds having a sufficient antioxidising effect on the surroundings. Thus a skilled person would have no incentive for making an anti-oxidising membrane into the top soil to protect the vulnerable plant roots/young plants, nor would the skilled person read the cited prior art with the aim of finding such a plant root protecting membrane. The closest cited prior art providing a mat with many of the similar properties, Morgan, teaches the opposite, to form a protective mat on-top of the soil. Based on at least the foregoing reasoning, claims 1 and 58 are patentable over Morgan.

Morgan fails to disclose a mixture for forming a film or membrane according to claims 1 and 58. Instead, Morgan discloses a mulch mat that is formed in aqueous foam. See Morgan at column 4, lines 8-9. The claimed invention is a powder mixture which, when dissolved in water or other polar solvents and administered to a soil surface, will penetrate a distance into the soil surface and set into a solid mechanically and chemically protective membrane. The membrane will endure for at least a couple of weeks, but may last an entire growth season or more, depending upon amounts and composition of the powder mixture. The mechanically and chemically protective membrane has a combined effect in that it is mechanically solid, wear resistant, water penetrable, water stabilising (retains moisture), antioxidising, and temperature regulating for the above mentioned period of time. This combined effect provides plants with a

protection against oxidants, disadvantageous temperatures, and drought through at least a part of the growth season. The claimed invention should thus not be considered as a fertilizer or mulch composition, it is primarily powder mixture forming a mechanically and chemically protective membrane in the top soil. The membrane has a secondary effect of being biodegradable and acting as a fertilizer, but only after servicing as the primary mechanically and chemically protective membrane.

A powder amount of 1 g per square meter soil surface corresponds to a need for only 10 kg of the powder per hectare land, which is at least one order of magnitude (often several orders of magnitude) lower than any comparable prior art. As mentioned previously, Morgan requires fibers in the general amount of at least 54 g per square meter. See Morgan at column 6, lines 58-67. The effectiveness of the claimed invention drives the costs down to a level where it becomes economically viable to employ the invention in a very large scale such as geo-engineering entire landscapes by changing the albedo. The specific combination of protections provided by this coating has shown impressively good results in various test sites with very different climate conditions in Kuwait, Egypt, Spain, and Norway in enhancing plant growth and in making barren land arable. Further, please note that the powder mixture according to the claimed invention does not include a reinforcing compound, but instead the cover/membrane forming mixture penetrates into and binds particulate material in the soil to give the necessary mechanical strength to the resulting membrane. This is believed to be one reason for the low dosages of dry powder required to make an effective membrane.

Morgan fails to disclose or suggest a mixture for forming a film or membrane wherein at least a portion of the film or membrane is formed at some distance down in the soil mass when the mixture is spread over the soil surface, arranged in the soil mass, or both, as specified in claim 58. Instead, and as stated previously, Morgan discloses a mulch mat having fibers that is disposed on the top surface of the soil. The claimed invention does not use fibres in the powder mixture since the aim of this membrane forming solution is to make the membrane form mainly into the soil, and not on-top of the soil. This difference makes it possible to obtain the same effects of fertilizing, erosion protection, temperature regulation etc. as the mat according to Morgan, but with only 1 - 3 g dry matter per square meter soil surface as opposed to about at least 54 g dry matter per square meter in Morgan. This is a difference of 2 to 3 orders of magnitude, and is a clear indication that it should not be considered obvious to a skilled person.

Mankiewicz discloses artificial soil including a plurality of foam plastic fragments. See the abstract of Mankiewicz. Mankiewicz describes the artificial soil in the context of Figures 1 and 2 beginning at column 3, line 4. The artificial soil is shown at reference 10 and includes fragments 14 of a light-weight foam plastic having a colloidal gel coating thereon, and forms a matrix 12 having pores 20. The outstanding Office Action apparently relies upon Mankiewicz for the disclosure of negative electric charges at column 7, lines 40-60. It is not seen where this portion of Mankiewicz actually discloses or suggests saturating a powder mixture with electrons to at least electrical neutrality according to the presently claimed invention. This portion of Mankiewicz states:

“the mechanisms involved could modify the concentration of oxygen and free electrons, thereby affecting the solubilities and availabilities of minerals at varying oxidation and reduction states. In microbial films, surface organisms use oxygen, while deeper within the film, using other electron acceptors, regulating the Eh or electron availability, facilitating anaerobic processes modifying mineral availability as well as pollutant removal capacity.

See Mankiewicz at column 7, lines 43-51. It is not seen how this disclosure by Mankiewicz can be perceived as a teaching or suggestion to saturate a powder mixture according to the present invention with electrons to at least electrical neutrality.

Furthermore, it is submitted that Mankiewicz fails to cure the other defects identified above with respect to Morgan. Mankiewicz fails to suggest modifying Morgan to provide a mixture for forming a film or membrane according to the present invention. As discussed above, Morgan discloses a mulch mass that is formed in aqueous foam. Mankiewicz fails to suggest modifying Morgan to provide a mixture that can form a film or membrane at some distance down in the soil mass when the mixture is spread over the soil surface, arranged in the soil mass, or both. Mankiewicz describes an artificial soil and would not have suggested modifying Morgan to provide a mixture for forming a film or membrane according to the presently claimed invention.

In view of the above comments, the claimed invention would not have been obvious from Morgan and Mankiewicz, and withdrawal of the rejection is requested.

35 USC 103(a) Claim Rejection over Morgan and JP 402195830 to Wake et al.:

The outstanding Office Action includes a rejection of claims 4 and 6 under 35 U.S.C. §103(a) over Morgan and JP 402195830 to Wake et al. This rejection is traversed.

It is understood that Wake et al. is actually JP 2195830. If the Examiner is referring to a different reference, it is requested that the Examiner clarify the rejection.

Wake et al. describe a filtrate of a cultured liquid of microalgae added as an artificial seed germination promoter to a basal medium, wherein the medium and a plant-producing tissue are imbedded in a water absorbing gel. See the English language abstract of Wake et al.

It is not seen how Wake et al. suggest modifying Morgan to achieve the presently claimed invention. Wake et al. fail to suggest modifying Morgan to provide a mixture that is saturated with electrons to at least electrical neutrality according to the presently claimed invention. Furthermore, Wake et al. would not have suggested modifying the mulch mass formed in an aqueous foam according to Morgan to achieve a mixture for forming a film or membrane according to the presently claimed invention. Furthermore, Wake et al. would not have suggested modifying Morgan to provide a mixture for forming a film or membrane wherein at least a portion of the film or membrane is formed at some distance down according to the presently claimed invention.

In view of the above comments, the claimed invention would not have been obvious from Morgan and Wake et al., and withdrawal of the rejection is requested.

35 USC 103(a) Claim Rejections over Morgan and US Patent 5,441,877 to Chiaffredo et al.:

The outstanding Office Action includes a rejection of claims 9 and 10 under 35 U.S.C. §103(a) over Morgan and U.S. Patent No. 5,441,877 to Chiaffredo et al. This rejection is traversed.

Chiaffredo et al. disclose a biologically enriched substrate containing organic matter rich in colonies of Cyanophyceae and Bryophytes for rapid creation of natural vegetation on bare terrain. See Chiaffredo et al. at Abstract.

It is not seen how Chiaffredo et al. suggest modifying Morgan to achieve the presently claimed invention. Chiaffredo et al. fail to suggest modifying Morgan to provide a mixture that is saturated with electrons to at least electrical neutrality according to the presently claimed invention. Furthermore, Chiaffredo et al. would not have suggested modifying the mulch mass

formed in an aqueous foam according to Morgan to achieve a mixture for forming a film or membrane according to the presently claimed invention. Furthermore, Chiaffredo et al. would not have suggested modifying Morgan to provide a mixture for forming a film or membrane wherein at least a portion of the film or membrane is formed at some distance down according to the presently claimed invention.

In view of the above comments, the claimed invention would not have been obvious from Morgan and Chiaffredo et al., and withdrawal of the rejection is requested.

35 USC 103(a) Claim Rejections over Morgan and US Patent 4,797,145 to Wallace et al.:

The outstanding Office Action includes a rejection of claims 11, 12, and 58 under 35 U.S.C. §103(a) over Morgan and U.S. Patent No. 4,797,145 to Wallace et al. This rejection is traversed.

Wallace et al. disclose a method for improving the physical properties of soil by the application of aqueous mixtures of agricultural polyelectrolytes and polysaccharides to the soil. See Wallace et al. at Abstract.

It is not seen how Wallace et al. suggest modifying Morgan to achieve the presently claimed invention. Wallace et al. fail to suggest modifying Morgan to provide a mixture that is saturated with electrons to at least electrical neutrality according to the presently claimed invention. Furthermore, Wallace et al. would not have suggested modifying the mulch mass formed in an aqueous foam according to Morgan to achieve a mixture for forming a film or membrane according to the presently claimed invention. Furthermore, Wallace et al. would not have suggested modifying Morgan to provide a mixture for forming a film or membrane wherein at least a portion of the film or membrane is formed at some distance down according to the presently claimed invention.

In view of the above comments, the claimed invention would not have been obvious from Morgan and Wallace et al., and withdrawal of the rejection is requested.

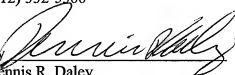
It is believed that this application is in condition for allowance. Early notice to this effect is earnestly solicited.



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Respectfully submitted,

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